

Editorial and Special Articles

The Manitoba Medical Association Review

Formerly the Bulletin of the Manitoba Medical Association

ESTABLISHED 1921

WINNIPEG, FEBRUARY, 1936

Published Monthly by the
MANITOBA MEDICAL ASSOCIATION
Editorial Office
101 MEDICAL ARTS BUILDING, WINNIPEG

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Annual Subscription - \$2.00

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In Memory
of Our Late
Sovereign
George V.

Executive Meeting

Minutes of a meeting of the Winnipeg members of the Executive of the Manitoba Medical Association, held in the Medical Arts Club Rooms on Wednesday, January 22nd, 1936, at 12.30 noon.

Present.

Dr. F. G. McGuinness	Dr. D. C. Aikenhead
Dr. F. W. Jackson	Dr. W. G. Campbell
Dr. F. A. Benner	Dr. A. S. Kobrinsky
Dr. C. W. Burns	Dr. R. R. Swan
Dr. E. S. Moorhead	Dr. C. W. MacCharles
Dr. W. E. R. Coad	Dr. O. J. Day (Guest)

Re. Victorian Order of Nurses

Correspondence from the Winnipeg Medical Society in reference to the Victorian Order of Nurses was considered, and a letter was read from Mrs. C. D. Shepard, President, Winnipeg Board of the Victorian Order of Nurses as to instructions from the Victorian Order of Nurses issued to the nurses in reference to the holding of welfare clinics.

After considerable discussion, it was moved by Dr. C. W. MacCharles, seconded by Dr. W. E. R. Coad: That a copy of the letter received from Mrs. Shepard be forwarded on to the Winnipeg Medical Society for their consideration. —Carried.

Correspondence in reference to the Public Health nurses on the School Health services staff prescribing, was considered by the Committee; also, letter in connection with nurses taking throat swabs. Dr. Day discussed the matter from the attitude of the Pediatricians and pointed out that he thought our present system of medical services employed in schools in Winnipeg, should be given further consideration.

It was moved by Dr. A. S. Kobrinsky, seconded by Dr. C. W. MacCharles: That a Committee be named by the President to take on the duty of surveying the present medical services supplied in Winnipeg schools, and report back to the Executive. —Carried.

Re. Programme for Annual Meeting.

The question of the Annual Meeting to be held in May, was then brought up and the Secretary suggested that the Post Graduate Committee of the Faculty of Medicine might be used in the preparation of the programme. It was felt, however, by the members of the Executive present that the Association itself should take on the whole duty of the preparation of the scientific programme, consulting the Post Graduate Committee of the Faculty of Medicine in order that there might be no overlapping between the two committees.

It was moved by Dr. D. C. Aikenhead, seconded by Dr. W. E. R. Coad: That Dr. C. W. Burns be convenor of the Scientific Programme Committee with power to add, and that he arrange a tentative programme and report back to the Executive.

Dr. Burns then requested information as to the duration of the programme, and also as to the availability of obtaining outside speakers. The Secretary was instructed to write to Dr. Routley in reference to outside speakers, and the Committee as a whole thought that the same length of programme, as in previous years, be adopted this year.

The meeting then adjourned.

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KING GEORGE'S PHYSICIANS

Sir Frederic Willans was in residence at Sandringham at the time that King George contracted his fatal illness. He was surgeon-apothecary to King George's Household at Sandringham. Sir Stanley Hewett, along with Lord Dawson of Penn, was called to Sandringham soon after the beginning of the illness. Sir Stanley Hewett was surgeon-apothecary to King George and is B. Chir., M.D., Cambridge. The Right Hon. Lord Dawson of Penn was Physician-in-Ordinary to King George. He attended the 98th annual meeting of the British Medical Association in Winnipeg in 1930, and was given an Hon. LL.D. by the University of Manitoba. He is President of the Royal College of Physicians, a member of the Medical Research Council and Physician to the London Hospital. He graduated from the University of London. Sir Maurice Cassidy, Physician-Extraordinary to King George, was called into consultation. Sir Maurice Cassidy is senior physician to St. Thomas Hospital. King George's last signature to a state document, that appointing a council of state, was witnessed by Lord Dawson in his capacity as a member of the Privy Council.

PROFESSOR WILKIE

D. P. D. Wilkie, O.B.E., M.D., Ch.M. (Edin.), F.R.C.S. (Edin.), F.R.C.S. (Eng.), Professor of Surgery, University of Edinburgh, was created a Knight Bachelor in the New Year's Honour list. Sir D. P. D. Wilkie is now one of the authors of Thomson and Mile's Text Book of Surgery. He first described the obstructive type of appendicitis in 1910 and has written numerous articles on surgical subjects particularly relating to the biliary tract. He is a member of the Medical Research Council. Professor Wilkie's work is well known to many graduates of the University of Manitoba who have studied at Edinburgh.

ONTARIO MEDICAL ASSOCIATION

The Annual Meeting of the Ontario Medical Association will be held in London, Ontario, on May 26-27-28-29. The program will be announced soon.

WINNIPEG MEDICAL SOCIETY

The regular monthly meeting of the Winnipeg Medical Society was held in the Physiology Lecture Theatre of the Medical College on Friday, January 17th. G. W. Fletcher, M.D., Professor of Oto-Laryngology, read a paper on "Plastic Nose Repair." J. C. Hossack, M.D., read a paper on "Neurosyphilis." James McKenty, M.D., F.R.C.S. (C.) discussed "The Relations of the Profession to Hospitals." Copies of Dr. McKenty's paper are to be sent to the members of the Society and it is to be discussed at the next regular meeting.

POST GRADUATE COURSES

The post graduate course on Gastro-enterology by members of the Faculty of Medicine has been well attended. Altogether 26 medical men registered for the course. These men came from western Ontario, Manitoba, and Saskatchewan. A post graduate course on Physiology for medical men in Winnipeg has now started. Up-to-date over thirty doctors have registered for this course. The program of this course is as follows: January 8—Address of Welcome and general introduction, A. T. Mathers, F.R.C.P. (C.), Dean of the Faculty and Professor V. H. K. Moorhouse; January 15 and 22—Cardiovascular System, J. M. McEachern, F.R.C.P. (C.); January 29—Respiratory System, J. D. Adamson, M.R.C.P. (Edin.); February 5 and 12—Gastro-Intestinal System, F. A. L. Mathewson, M.D.; February 19—Blood and Blood Forming Organs, L. G. Bell, M.R.C.P. (Lond.); February 26—Kidney, L. G. Bell, M.R.C.P. (Lond.); March 4—Skin, W. G. Brock, M.D.; March 11—Sympathetic System, C. E. Corrigan, F.R.C.S. (Eng.); March 18 and 25—Nervous System, A. T. Mathers, F.R.C.P. (C.); April 1—Liver and Pancreas, C. R. Gilmour, F.R.C.P. (C.); April 8—Reproduction, F. G. McGuinness, B.A.O., F.R.C.S. (C.); April 15—Bone, Bruce Chown, M.D.

Department of Health and Public Welfare

NEWS ITEMS

SCARLET FEVER

During October of 1935 there was a sharp upturn in the reported cases of scarlet fever, carrying the figure well above our endemic index, and remaining so during November and December. Cases have occurred in all sections of the province, and up to the middle of January, 1936, there was no indication that the incidence was sinking to what might be considered a normal level.

So far as is known, the disease was generally of a mild character, only three deaths occurring among 815 cases up to the end of October, 1935; this fact probably has some bearing on the difficulties experienced in efforts to control the disease in some communities. The unrecognized and unreported cases make quarantine less effective than it should be, but it is unlikely that this explains wholly the failure to control the disease, for undoubtedly there are unrecognized carriers who account for continued outcropping of cases and keep the disease alive. The control of the disease by nose and throat culture is still in what might be termed the experimental stage, and as there is no relatively simple method of identifying the specific organism, the cost of the procedure would be prohibitive, and consequently, so far as cases are concerned, we must continue to rely largely on isolation for a minimum number of days, which seems compatible with the provision of safety for the community.

During the scarlet fever epidemic in Milwaukee 1934-1935 Koehler (1) reports 70 per cent. of cases had two cultures, negative for haemolytic streptococci after three weeks, and 85 per cent. after four weeks; also 1,142 cases released after three weeks showed 2.7 per cent. secondary cases, and 1,457 released after four weeks showed 1.3 per cent. secondary cases. After four weeks there are still virulent carriers, and Koehler reports that 229 cases released in 5 weeks had 3 per cent. secondary cases. This method of release from isolation after a set period of time leaves much to be desired, but at the moment is the only practical course open. Whether the minimum period is for twenty-eight days, or twenty-one days, as suggested by the recent report of the American Public Health Association on the Control of Communicable Diseases, no patient should be released if there is indication of complicating ear, nose, throat or abscess discharge.

The application of prompt and effective isolation and quarantine seems to yield more satisfactory results in rural districts than in large centres.

The handling of contacts varies with the communities involved and the attending circumstances when the case is treated at home. Sometimes susceptible contacts can well be placed under observation for seven days in a household where there are no susceptibles; the closing of school may be considered in rural districts where the school is the only centre of intercourse, but in cities this seems to be of little value. In the recent Milwaukee epidemic all children under the age of seven were quarantined in their homes under police supervision.

Although the mortality from the disease has for a long time been comparatively low, different outbreaks may assume unusual severity. The mortality rate in Manitoba in 1934 was .42 per 100,000 of the population, and the figures available so far for 1935 indicate that there will probably be little change, but in Milwaukee for 1934 (2) there were 24 deaths among 5,964 cases, or a mortality rate of about 3.3 per 100,000, and for the first six months of 1935 24 deaths occurred in 4,541 cases; in the State of Iowa for the

first ten months of 1935 there were 66 deaths, indicating an expected mortality of 3. per 100,000 of the population.

There are still being reported death rates over 20 per 100,000 of the population in some Central European countries. Is it possible that the disease may swing in a cycle of greater severity in this country?

At the present moment it is not the resultant mortality, but the complications which make scarlet fever a dangerous disease, although in recent years treatment with scarlet fever antitoxin may be lessening the possibility of their appearance. Taylor (3) reports that of 500 cases treated with antitoxin, 52 developed rhinitis and 15 had discharge severe enough to hold them in quarantine an average of 26 days past the normal time. Prior to the use of antitoxin, in a review of 290 cases, 60 developed rhinitis, 16 of the 500 developed otitis media, and of the 290 untreated cases 21 developed otitis media; mastoiditis in the first mentioned series occurred seven times, and in the second, 21 times; adenitis in 9 cases of the 500 and in 27 cases of the 290. Roseneau (4) states nephritis complicates 5 per cent. of cases, that it comes on about the third week and is just as likely to follow the mild as the severe form.

Judging by the number of enquiries received by the Department during the last couple of months from physicians, school boards and parents throughout the province there is a good deal of interest being taken regarding the possibility of conferring active immunity against the disease, and more material for this purpose has been issued during the past three months than for the whole of last year. During the immunization programme in Milwaukee, during which 6,000 children received the five doses of toxin, 5,700 of these were re-Dicked, and 93 1/2 per cent. were found negative; during the preliminary Dick test 66 per cent. of those tested were found positive. The routine followed during this programme was as follows:

1. Every child was given a medical inspection before it was given the first dose of scarlet fever toxin. Children with chorea, rheumatism, heart disease, asthma, eczema and other allergic ailments were not immunized.
2. Every child had its temperature taken before each dose of toxin in order to exclude those who might be ill. At first a temperature of 99.6° was the maximum permissible, but this temperature was so common among the children that the maximum was soon raised to 100° F.
3. Whenever possible, all immunization work in schools was done in the afternoon. Some children immunized during the forenoon vomited during the afternoon and upset the entire classroom.
4. When immunization treatments were given in the morning the school nurse remained at the school during the afternoon.
5. A nurse and doctor were on duty in school on the day following immunization for the purpose of inspecting rashes and other signs of reactions.
6. Printed notices were given parents at the time of the first injection advising them of some of the reactions that might occur and assuring them that there would be no cause for alarm.
7. Every child absent from school following an immunization treatment was visited by the school nurse.
8. Since all children, no matter how severe the reactions, made a complete recovery, it was finally decided not to have the nurse follow up such cases in the homes. Whenever possible, school immunization clinics were conducted on a Friday afternoon to reduce school interference to a minimum.

The reactions resulting from scarlet fever immunization are more frequent than from the injections of diphtheria toxoid. In the Milwaukee experience the reactions were described as (1) severe systematic, 3 per cent., temperature 102, prostration, vomiting and diarrhoea. (2) Moderate systematic 15 per cent., lassitude, noticeable rise in temperature, some nausea and vomiting, rash and muscular pains. (3) Mild systematic 16 per cent., rash, slight rise in temperature. (4) Local reactions 23 per cent., redness and swelling of the arm and some local pain. (5) No reactions 43 per cent.

Of these 6,000 children only fourteen eventually developed scarlet fever, representing a morbidity rate of 2.3 per 1,000 children as compared to a rate of 60 per 1,000 of the unimmunized school children.

Other recent experiences also seem to indicate that better results can be anticipated from the active immunization than had been expected up to a short time ago, although up to the present time, in Manitoba, experience with scarlet fever immunization has not yielded as high a percentage of immunes after five doses as is indicated in the above mentioned references, and it is, therefore, still recommended that a Dick test be done after completing the five doses of toxin and if the reaction is positive further doses of the toxin be given.

Dick test material and scarlet fever toxin are distributed free through the Department of Health and Public Welfare.

—C. R. D.

- (1). (2) J. P. Koehler—Recent Experiences in Scarlet Fever Control. *Am. Jl. P.H.* Dec. 1935. 1359-1366.
- (3) Ellen F. Taylor—Scarlet Fever—*Can. Med. Assn. Jl.*, XXIII, 56-57, 1930.
- (4) M. J. Roseneau—Preventive Medicine and Hygiene, 6th Edition, P. 95.

INFLUENZA

From January 1, 1935, to November 30, 1935, there were recorded fifty-eight deaths from influenza, and during that time there was no indication that there was anything in the nature of an epidemic in this province. So far as can be judged now, the influenza deaths for 1935 will be about the same as for 1934, but considerably less than for 1933, when they were 223. During part of December, 1935, and January, 1936, there has appeared a febrile condition widespread over the province which is being called the "grippe" and "influenza;" if this disease is considered to be influenza, very few cases are being reported, as up to date the Department of Health and Public Welfare has been notified of less than 100 cases. This is a reportable disease under the Provincial Board of Health Regulations and the Department would ask that all cases of influenza be reported to the medical officers of health.

RECENT ADVANCES IN THE STUDY OF INFLUENZA

By

THOMAS FRANCIS, Jr., M.D.

In the Journal of the American Medical Association
July 27, 1935.

The lack of sharp differential features has rendered it difficult to separate influenza as a well-defined clinical entity from many other mild infections of similar symptomatology that may invade a community. Thus the term "influenza" has been carelessly applied to various vague diseases of comparatively high morbidity which are associated with chills and generalized aches and pains and are of brief duration.

One may adopt, as requisites for the diagnosis of influenza, certain criteria such as sudden onset with constitutional symptoms, chilliness, fever, myalgia, headache, mild respiratory symptoms without coryza,

the presence of leukopenia, and a course of from two to three days followed by considerable asthenia and exhaustion. These may serve as a working basis but are insufficient to exclude other entirely different diseases that exhibit a similar clinical picture.

A comparable state of uncertainty has prevailed in regard to the causative agent of influenza. Many different bacteria have been implicated, particularly *Haemophilus influenzae* and *Bacterium pneumosintes*, but in no case has the evidence been sufficiently convincing to permit of their acceptance as the specific causative factors. Certain scattered data have previously been presented which suggest that the etiologic agent belongs to that group of ultramicroscopic infectious agents called filtrable viruses.

In recent years, however, three different series of studies have been carried on which have again increased the interest in the etiology of influenza. These three series of investigations have been concerned with diseases involving the respiratory tract, which in each case has permitted of study of a disease occurring in its natural host.

The first of the series comprises the studies undertaken by Dochez, Shibley, Kneeland and Mills, and Long and his co-workers on the common cold. Briefly, the results of the investigation indicate that the common cold in man is produced by a filtrable virus which can also initiate a similar condition in the chimpanzee, and that the virus can be grown in artificial mediums and after cultivation still maintains the capacity to induce common colds in human individuals.

The second study, carried out by Laidlaw and Dunkin, was concerned with dog distemper, a highly infectious respiratory disease. These investigators, in addition to their work with dogs, the natural hosts, succeeded in transferring the disease to ferrets and were enabled thereby to study the disease experimentally in a stock known to be free from natural infection and maintained under conditions of rigid quarantine. They were able to establish the fact that this malady is caused by a filtrable virus.

The third set of investigations is that of Shope, relating to a respiratory disease of swine, which, so far as is known, first made its appearance at the time of the influenza pandemic of 1918-1919. This disease has been called swine influenza, or hog flu. It is characterized by fever, loss of appetite and weight, cough, respiratory distress and pulmonary consolidation, but it is of comparatively low mortality. Shope, in a series of brilliant studies, was able to demonstrate that the disease was produced and transmitted through contact infections by a filtrable virus in symbiosis with a bacterium of the group to which the human types of *Haemophilus influenzae* belong. The bacillus alone injected into the nose of a hog, except in rare instances, produced no effect; the filtrable virus alone produced a mild and, at times, unrecognizable infection but one which, nevertheless, was followed by a firm immunity against infection by the two agents combined. Furthermore, it was possible, by the subcutaneous injection of the filtrable agent into swine, to induce a state of immunity that protected against infection when the virus and influenza bacillus were injected together into the nose of the hog.

Studies such as these have served to heighten the probability that similar conditions may obtain in other epidemic respiratory infections, especially those of man.

In 1933 Smith, Andrews and Laidlaw instilled into the noses of ferrets filtered nasopharyngeal washings obtained from human patients during the acute stage of influenza. Two days after inoculation the ferrets became ill with fever, apathy, loss of appetite and nasal catarrh. The ferrets were killed on the third or fourth day after the onset of fever, and, with emulsions of the nasal turbinates bones of such animals, these investigators were able to transmit the disease to other ferrets. The only pathologic change that they found in the infected animals was inflammation

of the nasal mucous membranes. Ferrets that recovered from the disease were found to be immune to reinfection. The serum of these recovered animals contained anti-bodies that were capable of neutralizing the action of the infective agent when the serum and infectious material were mixed and then inoculated into a susceptible ferret. Similar antibodies were detected in the serum of men convalescent from influenza and in the serum of other human individuals as well. The active agent was found to be a filtrable virus, and the addition of various bacteria caused no definite difference in the experimental disease.

In addition, the British workers were able to transmit the virus of swine influenza to ferrets, producing a disease indistinguishable from that caused by the human strain of virus. Shope was able to confirm their observations regarding swine influenza in ferrets. Furthermore, he found that, when suspension of finely ground lung of infected hogs or bacteria-free filtrates of such suspensions were injected intranasally into anaesthetized ferrets, there developed, in addition to the inflammation of the nasal mucous membranes, involvement of the lung itself. The pulmonary involvement was of lobar distribution, firm and markedly edematous. The alveolar walls were thickened with many mononuclear and polymorphonuclear cells, while in the alveolar spaces the exudate was sparse and composed primarily of mononuclear cells. After repeated passages in ferrets the virus still retained its infectivity for swine, producing characteristic swine influenza bacilli, while in the experimental disease in ferrets no bacterial component was required. The serum of recovered swine or ferrets was found to be capable of inhibiting the activity of the virus.

With the results of these studies as a background, during the winter of 1933-1934 I inoculated material from various human respiratory infections into the nasal passages of ferrets, but, with the exception of one instance of definite bacterial origin, I was unable to establish any disease in the animals.

In the early autumn of 1934, however, a widespread epidemic of influenza occurred in Puerto Rico. Through the kindness of physicians of the International Health Board, sputum was obtained from patients during this epidemic. The sputum was placed in sealed bottles of 50 per cent. glycerin, packed in a vacuum jug with ice and shipped to New York by air mail. The materials were received from three to five days after collection. The sputum was washed free from glycerin and emulsified with Lock's solution; the emulsions were inoculated into the nasal passages of ferrets lightly anesthetized with ether. On the second day after inoculation, fever developed in all the animals. Three days later one of these was killed and the lungs and turbinates were removed and ground in a mortar with sand and meat infusion broth. Part of the material was centrifuged and filtered through a Berkefeld V filter. Two ferrets were given the unfiltered suspension intranasally; another was given the bacteria-free filtrate by the same route. All three animals were taken sick, and with the virus recovered from these animals it has been possible to transfer the disease in serial passages from ferret to ferret by means of suspensions of filtrates of either ground lung or turbinete.

In the first few passages of the virus through ferrets the disease is characterized by a diphasic type of fever and mild apathy, but little else. After a few passages, however, in the lungs of ferrets that are killed on the fourth or fifth day, bluish consolidation of the lower lobes is usually noted, and subsequently similar involvement of the lungs has almost always occurred after intranasal infection. In animals with pulmonary involvement the disease is more severe. Their respirations are rapid, somewhat jerky and labored, and at times moaning in character. A short dry cough may be noted. There may be a watery nasal and conjunctival discharge. The animals, usually alert and active, are apathetic and lie quiet in their cages, eating little. After from five to six days, recovery begins

and the animal rapidly regains an apparently normal interest in food and in its surroundings. Recovery is almost invariably the rule.

On the fourth day after the original material was obtained from Puerto Rico, one of the laboratory assistants was taken sick, and two days later another assistant was also taken sick, both with symptoms typical of influenza. The throat washings obtained from these two patients at the height of the disease were inoculated into ferrets, and a characteristic experimental disease was produced. These observations indicate the infectiousness of the material for man, since influenza was not known to be prevalent in the community at that time.

The disease in mice, after intranasal infection, is primarily one of the respiratory tract and essentially of the lungs. The rapidity of the course of the disease depends, to a certain extent, on the concentration of the infectious agent in the inoculum. After the intranasal instillation of a 5 per cent. suspension of lung tissue, the mice begin to sicken on the second or third day; they are quieter, their coats become ruffed, and they huddle together and eat but little. The respirations become exaggerated, labored and audible, the eyes become wet and staring, and the animal dies in from four to eight days.

At autopsy, the lungs are almost completely involved. They are distended and a reddish blue; the surfaces are smooth and glistening, and when the lungs are removed from the body considerable froth exudes from the trachea. In the earlier stages, the involvement is most marked in the dorsal aspects of the upper lobes and about the roots of the lobes. It has been possible to carry the disease through many transfers in mice, with only an occasional survivor. From the lungs of the mice one can in turn infect the ferret, producing a characteristic illness.

While these studies were in progress, Andrews, Laidlaw and Smith reported independently that they had been successful in establishing the human and swine influenza viruses in mice with a resulting pathologic picture similar to that which we have described.

The results of filtration and cultural studies indicate that the infective agent of epidemic influenza is a filtrable virus. The infection has not been transmitted readily by contact from infected to normal animals or by other routes than the respiratory tract.

We have succeeded in recovering a similar infectious agent from the nasal washings of patients during the recent mild epidemics of influenza in New York and Philadelphia. The studies with these strains have not been carried out extensively as yet, but the course of the experimental disease in ferrets and mice is much the same. The blood of patients suffering from influenza, in spite of the generalized symptoms, has not been found to infect the mouse or the ferret, nor has it been possible with the throat washings of patients to transfer the infection directly to mice.

Also on the subject of influenza Francis reports in the *Journal of Experimental Medicine*, October 1, 1935, in part as follows:

"A state of immunity as measured by circulating antibodies and active resistance follows recovery from infection with the virus of influenza. That the mere presence of neutralizing antibodies in the circulating blood may not necessarily assure a complete refractory state to reinfection is recognized. Ferrets which have developed neutralizing antibodies following experimental or presumably direct infection exhibit little or no reaction to reinfection. In certain instances, however, reinoculation may elicit a brief febrile reaction without other evidence of infection. Attempts to recover virus from these animals indicate that although the immunity acquired as a result of infection may not be sufficiently absolute to prevent febrile reactions on reinfection, the virus is quickly neutralized and from these animals is not so readily recoverable as it is from normal animals infected for the first time.

If a similar set of circumstances prevails in the natural disease in man, the experimental results suggest a possible explanation for the lack of uniform success in attempts to recover virus from all patients with influenza.

Virus neutralization tests with serum of influenza patients taken during the acute stage of the disease, during early convalescence and at later periods, have shown that the serum of the individual at the height of the disease fails to neutralize the influenza virus, whereas serum taken from the same patient during convalescence does contain specific antibodies. These antibodies are not evanescent, but persist for several months at least, as evidence by the neutralizing capacity of serum obtained from patients 6-8 months after recovery from influenza.

Similar studies with the serum of patients ill with, and recovering from, pneumococcus pneumonia, have shown that in general specific antibodies neutralizing the influenza virus do not develop in response to pneumococcus infection. Studies of the antibody content of the serum of human individuals before, during and after a common cold were made. The results indicate that this type of respiratory infection does not stimulate the formation of antibodies against the virus of influenza. It appears, therefore, that the neutralizing action of the serum of human individuals is a specific response to infection with the influenza virus."

COMMUNICABLE DISEASES REPORTED

Urban and Rural - December, 1935

Occurring in the Municipalities of:-

Mumps: Total 427—Winnipeg 179, St. Boniface 56, Gretna Village 51, St. Paul East 29, Kildonan East 17, St. James 12, Unorganized 12, Kildonan West 9, Eriksdale 5, Rosser 3, Norfolk North 3, Kildonan North 2, Fort Garry 2, St. Andrews 2, Transcona 2, Arthur 1, Assiniboia 1, Brandon 1, Dauphin Town 1, De Salaberry 1, Minto 1, St. Clements 1, (Late reported—November—St. Boniface 32, Kildonan West 3, Carberry 1).

Measles: Total 424—Winnipeg 266, St. Boniface 20, Kildonan East 18, St. Vital 14, St. James 11, Macdonald 11, Flin Flon 9, Glenwood 9, Fort Garry 8, Archie 7, Westbourne 7, Stonewall 6, Woodlands 5, Transcona 4, Assiniboia 3, Norfolk South 3, St. Andrews 3, Brandon 2, Edward 2, Melita 2, Norfolk North 2, Portage City 2, Springfield 2, Bifrost 1, Kildonan West 1, Rockwood 1, St. Clements 1, St. Paul East 1, Thompson 1, Unorganized 1, Whitemouth 1.

Chickenpox: Total 319—Winnipeg 179, Brandon 32, Teulon 20, Miniton 13, Woodlands 12, Flin Flon 10, St. James 8, Kildonan East 6, St. Boniface 5, Swan River Town 4, Neepawa 3, Portage City 3, Silver Creek 2, St. Vital 2, Hamiota Rural 1, Kildonan North 1, Sifton 1, Transcona 1, Turtle Mountain 1, Wallace 1, Westbourne 1, Whitehead 1, (Late reported—November—Miniton 9, St. Boniface 3).

Scarlet Fever: Total 206—Winnipeg 74, Miniton 10, Flin Flon 9, Roland Rural 9, St. Clements 9, Brandon 8, Unorganized 6, Grey 5, Kildonan East 5, Kildonan West 5, Roblin Rural 5, Louise 4, Pembina 4, Birtle Rural 3, Birtle Town 3, Ellice 3, Gretna Village 3, Lac du Bonnet 3, Norfolk North 3, Rhineleland 3, St. Boniface 3, Daly 2, Manitou 2, Norfolk South 2, Portage City 2, Strathclair 2, St. Vital 2, Bifrost 1, Brenda 1, Cornwallis 1, Foxwarren Village 1, Harrison 1, Kildonan North 1, Morden 1, Neepawa 1, Rapid City 1, Rockwood 1, Rosedale 1, Rosser 1, Russell Town 1, Silver Creek 1, Stanley 1, Victoria 1, (Late reported—November—St. Boniface 1).

Whooping Cough: Total 96—Woodlands 24, Winnipeg 19, Brandon 15, St. James 10, Unorganized 7, Flin Flon 4, Sifton 3, St. Boniface 2, Fort Garry 1, Kil-

donan West 1, Stonewall 1, (Late reported—October—Ethelbert 1, Lorne 1, —November—Ethelbert 1, Lorne 2, Richot 1, St. Boniface 3).

Tuberculosis: Total 29—Winnipeg 11, Unorganized 4, Fort Garry 2, St. James 2, Cartier 1, Ellice 1, Flin Flon 1, Franklin 1, Hanover 1, Norfolk North 1, Pembina 1, Portage City 1, St. Laurent 1, Thompson 1.

Diphtheria: Total 20—Winnipeg 9, La Broquerie 3, Roland Rural 2, St. Boniface 2, Unorganized 2, Charleswood 1, The Pas 1.

Erysipelas: Total 16—Winnipeg 5, Brooklands 1, Dufferin 1, Hanover 1, Kildonan West 1, Rhinelander 1, Stanley 1, St. Boniface 1, Transcona 1, Unorganized 1, (Late reported—November—Stanley 1, Winchester 1).

German Measles: Total 14—Unorganized 5, Stonewall 3, Macdonald 2, Edward 2, Dauphin Town 1, (Late reported—November—St. Boniface 1).

Influenza: Total 9—Winnipeg 1, (Late reported—October—Mossie River 2, Cameron 1, St. Boniface 1, —November—Eriksdale 1, Franklin 1, Roland 1, Unorganized 1).

Typhoid Fever: Total 5—Brandon 2, Boulton 1, Oakland 1, (Late reported—November—Eriksdale 1).

Diphtheria Carriers: Total 2—St. Laurent 1, Unorganized 1.

Trachoma: Total 1—Morris Rural 1.

Lethargic Encephalitis: Total 1—(Late reported—November—Unorganized 1).

Anterior Poliomyelitis: Total 1—(Late reported—October—Miniton 1).

Cerebrospinal Meningitis: Total 1—St. Clements 1.

Venereal Disease: Total 133 — Gonorrhoea 101, Syphilis 32.

DEATHS FROM ALL CAUSES IN MANITOBA

For the Month of November, 1935.

URBAN—Cancer 40, Pneumonia 27, Tuberculosis 10, Influenza 5, Syphilis 5, Puerperal 2, Whooping Cough 2, Scarlet Fever 1, all others under 1 year 5, all other causes 152, Stillbirths 11. Total 260.

RURAL—Cancer 28, Pneumonia 17, Tuberculosis 17, Whooping Cough 4, Influenza 3, Erysipelas 2, Puerperal 1, Mumps 1, all others under 1 year 1, all other causes 134, Stillbirths 16. Total 224.

INDIAN—Tuberculosis 7, Pneumonia 2, Measles 1, Cancer 1, Syphilis 1, all other causes 14. Total 26.

NOTICE TO MANITOBA PHYSICIANS

The Department of Health and Public Welfare will probably have some scholarships available for a course in Public Health leading to the diploma of health, University of Toronto, through the generosity of the Connaught Laboratories, and are prepared to receive for consideration applications from practicing physicians in Manitoba. Preference will be given to those doing health officer work, particularly municipal physicians.

Further information can be obtained by writing direct to the Deputy Minister of the Department of Health and Public Welfare.

Medical Library University of Manitoba

A summary of the contents of some of the journals available for practitioners, submitted by the Faculty of Medicine of the University of Manitoba. Compiled by T. E. HOLLAND, B.Sc., M.D. (Man.), F.R.C.S. (Edin.).

"The Practitioner"—December, 1935.

This number contains a symposium on Diseases of the Thyroid gland as well as a number of other articles.

"Diseases of the Thyroid" — by Sir Humphry Rolleston, Bart., Acting Pres. British Medical Association.

"The Medical Treatment of Toxic Goitre"—by F. R. Fraser, M.D., F.R.C.P., Professor of Medicine, University of London.

"The Surgical Treatment of Toxic Goitre"—by Geoffrey Keynes, M.D., F.R.C.S., Assistant Surgeon, St. Bartholomew's Hospital.

"Myxoedema"—by O. L. V. de Wesselon, M.D., F.R.C.P., Professor of Medicine, University of London.

"Diseases of the Thyroid Gland in Children"—by E. A. Cockayne, M.D., F.R.C.P., Physician, Middlesex Hospital and the Hospital for Sick Children, Great Ormond St.

"The Basal Metabolic Rate: Its Meaning and Interpretations"—by J. Douglas Robertson, M.D., Clinical Chemical Pathologist to the Middlesex Hospital.

"On Some Minor Digestive Errors"—by Joseph Geogham, M.D., F.R.C.S.E., Phys. to Out-Patients, Royal Hospital, Richmond.

"Some Observations on Artificial Pneumothorax"—by Bernard Hudson, M.A., M.D., M.R.C.P., Medical Superintendent—The Victoria, British Sanatorium, Davos, Switzerland.

"The Journal of the American Medical Association" December 21st, 1935.

"Intermittent Pressure and Suction in the Treatment of Chronic Occlusive Arterial Disease"—by Edgar V. Allen, M.D., and George E. Brown, M.D., Rochester, Minn.

"Ether-Oil Analgesia in Obstetrics—Modified Technique"—by James T. Gwathmey, M.D., New York, and C. O. McCormick, M.D., Indianapolis.

"Vinyl-Ether Obstetric Anaesthesia for General Practice"—by Wesley Bourne, M.D., F.R.C.P. (Can.) Montreal.

These papers were read before the Section on Obstetrics, Gynaecology and Abdominal Surgery at the meeting of the American Medical Association, June 1935. A discussion of the papers is included.

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"The Clinical Journal"—December, 1935

"Acute Laryngeal Obstruction"—by Edward D. D. Davis, F.R.C.S., Surgeon, Ear, Nose and Throat Department, Charing Cross Hospital.

"Sterility in Women"—by A. C. Palmer, F.R.C.S., Gynaecological and Obstetrical Surgeon, King's College Hospital.

"Flat and Painful Feet"—by R. Broomhead, Hon. Surgeon, Orthopaedic Dept., General Infirmary, Leeds.

"The Causes and Treatment of Anaemia"—by Charles Seward, M.D., F.R.C.P., Hon. Ass't. Phys., Royal Devon and Exeter Hospital.

"Mesenteric Cyst (?) Mullerian Duct Origin in the Male"—by G. H. Edington, D.Sc., F.R.C.S., Hon. Consulting Surgeon, Western Infirmary, Glasgow.

"Torsion of the Fallopian Tube"—by K. F. D. Waters, B.A., B.M., B.Ch., F.R.C.S.E.

"The American Journal of Surgery"
—November, 1935.

This issue contains a symposium on Present-Day Treatment of Cancer of the Oro-Pharynx. The following articles discuss the disease and its treatment in the various parts of the oropharynx. The articles are extremely well illustrated by diagrams and photographs showing procedure in operative and radiation therapy.

"Metastatic Epidermoid Carcinoma in the Neck"—
—Technical Considerations in the Combined method of Treatment"—by Douglas Quick, M.B. (Tor.), F.A.C.S., New York City.

"Treatment of Cancer of the Lip"—by Hayes E. Martin, M.D., Attending Surgeon, Memorial Hospital, New York City.

"Radiation Therapy of Malignancy of Tongue"—
—by Ira A. Kaplan, B.Sc., M.D., Director, New York City Cancer Institute.

"Surgical Aspects of the Treatment of Carcinoma of the Tongue"—by Edward M. Livingstone, M.D., and Hyman Lieber, M.D., New York City.

"Cancer of the Cheek & Neighboring Bone"—
—by Vilray P. Blair, M.D., F.A.C.S., James Bennett Brown, M.D., F.A.C.S., and Louis T. Byars, M.C., St. Louis, Mo.

"Practical Management of Malignancy of the Tonsil"——by Carl Effers, M.D., F.A.C.S., New York City.

"Radiotherapy of Cancer of the Larynx"——by Maurice Lenz, M.D., New York City.

The following articles in the same number are also of interest.

"The Jaundiced Patient"—by Isidore Cohn, M.D., F.A.C.S., Tulane University.

"Complete Anuria in Perforated Gastric Lesions":
Report of Two Cases—by Abraham D. Segal, M.D., and J. Sturddevant Read, M.D., Dept. of Urology, Coney Island Hospital, Brooklyn, N.Y.

"Spinal Anaesthesia"—by Justin J. Stein and Ralph M. Tovell, The Mayo Clinic.

"The Journal of the American Medical Association"
—November 2, 1935.

"The Etiology of Heart Disease": With Special Reference to the Present Status of the Prevention of Heart Disease — by Howard B. Sprague, M.D.; and Paul D. White, M.D., Boston.

"An Analysis of the Apparent Increase in the Heart Diseases"—by Alfred E. Cohn, M.D., New York.

"The Heart in Hypertension"—by George Fahr, M.D., Minneapolis.

"The Rehabilitation and Placement in Industry of those handicapped with Cardio-vascular Disease"—by William D. Stroud, M.D.

"A Critical Analysis of Heart Disease Mortality"—by O. F. Hedley, M.D., Philadelphia.

—The above papers on Heart Disease were read at the Annual Meeting of the American Medical Association, June, 1935. An abstract of the discussion which followed is also included in this number of the Journal.

A summary of the contents of some of the journals available for practitioners, submitted by the Faculty of Medicine of the University of Manitoba. Compiled by T. E. HOLLAND, B.Sc., M.D. (Man.), F.R.C.S. (Edin.).

"The Canadian Medical Association Journal"
—November, 1935.

"The Importance of Rest and Liver Therapy in the Treatment of Subacute Combined Degeneration of the Cord"—by R. F. Farquharson, M.B., F.R.C.P. (C), Toronto.

—Spinal Cord lesions in Pernicious Anaemia are completely arrested by administration of potent liver extracts, preferably intramuscularly.

"Blood Dyscrasias Amenable to Treatment by Splenectomy"—by Edward S. Mills, Montreal.

"Splenectomy: Operative Procedure and After-Care"—by A. T. Bazin, Montreal.

—The above two papers formed part of a Symposium at Atlantic City on "Anomalies of Blood Formation in relation to the Role of the Spleen."

"The Relief of Pain During Labour"—by Leighton C. Conn, F.R.C.S. (C), and John Ross Vant, M.C.O.G.

—From the Department of Obstetrics and Gynaecology, University of Alberta, Edmonton.

"The Usefulness of Anaesthetic Agents"——by John S. Lundy, M.D.

—Section on Anaesthesia, The Mayo Clinic, Rochester, Minn.

"What about Tonsils?" — by S. B. MacMillan, F.R.C.S. (Edin.), The Lockwood Clinic, Toronto.

"Annals of Internal Medicine"—April, 1935.

"The Influence of Dietetic and other Factors on the Swelling of Tissues in Arthritis"—Preliminary Report by C. W. Seull, Ph.D., and Ralph Pemberton, M.D., F.A.C.P., Philadelphia.

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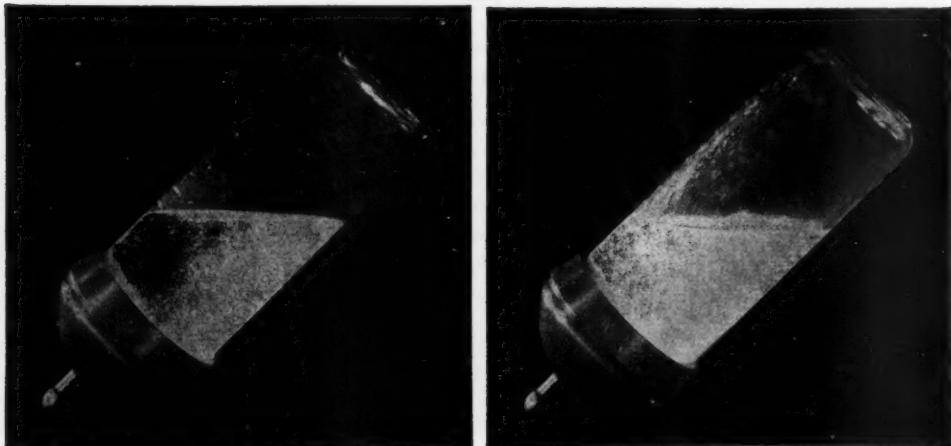
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Clinical Section

*Upper Respiratory Sepsis

AETIOLOGY

and

SOME CONSIDERATIONS ON IMMUNITY

By

DANIEL NICHOLSON, M.D. (Man.), M.R.C.P. (Lond.)

Assistant Professor of Pathology
University of Manitoba

In the present imperfect state of our knowledge regarding upper respiratory infection we are forced to consider many factors, some of which are probably of minor importance. We may be totally unaware of the real significance of the whole phenomenon. We observe certain changes and interpret their significance according to our present lines of reasoning. Future methods, as yet undreamed of, may produce a complete change of outlook. Fifty years ago there was great controversy about whether or not the membrane should be stripped from a diphtheritic throat and what was the best local application to use. The medical conceptions were mainly of a mechanical and crude chemical variety. How different that was from our viewpoint today! The future may hold a similar advance in theory and practice for upper respiratory sepsis. In fact a good beginning has already been made. There is no place for fixed ideas and dogmatic views on this subject, at least not for very long.

Classification of causes is difficult because there seems to be so many. As we see them today, it is difficult to place correct emphasis on those of great importance and to indicate those of minor significance. In attempting a grouping I am going to leave those I think most important until last. Because there are serious gaps in our knowledge regarding the immune mechanism, predisposing causes in the past and present are given a position of undue actual importance. We should be fully aware of this so we will be ready to use more direct methods of prevention and cure as they become available.

Anatomical Defects.

Poorly developed noses having inadequate air spaces and defective drainage are generally considered more prone to infection than well developed noses with adequate air passages. This information has been handed down by generations of physicians. It is an impression from observation and is probably correct, but many a cherished idea implicitly believed for generations has been finally proven utterly wrong. It is curious that sinusitis usually develops on the side of a nose having the widest air space. As there is great variation in the structure of the nares and sinuses

of apparently normal noses, we may suspect that this feature has been over emphasized.

Perhaps the commonest obstruction in the posterior nasopharynx in early childhood is the overgrowth of adenoid tissue resulting from infection. Other prominent causes preventing proper nasal development are:

1. Faulty nutrition in early childhood, especially the lack of vitamins A and D which are present in cod liver oil.

2. Hereditary factors. A particular type of nose may be the most constant feature in family resemblance.

Pathological Tissue Changes.

Under pathological changes we may list the thickened membrane or suppuration which obstructs the airway or sinus ostia in acute and chronic rhinitis and sinusitis.

In acute sinusitis the membrane lining the sinus is 10 to 15 times its normal thickness. It is so edematous that it appears like jelly. The exudate is mostly mucus containing some pus cells and bacteria. Every "cold in the head" is really a sinusitis. No acute process takes place even in the nasopharynx without also involving the antrums. It is remarkable that complete recovery almost always takes place spontaneously and the greatly thickened membrane returns to normal.

It is rare in acute empyema for the membrane to ulcerate. Occasionally the infection is of dental origin, and after removal of an abscessed tooth which has extended into the antrum it is very difficult indeed to close the sinus from the mouth. This provides a constant source of reinfection.

Chronic Sinusitis and Its Contributory Causes.

Frequently repeated attacks of acute sinusitis lead to chronic sinusitis. The thickened membrane is covered by epithelium and consists of connective tissue sparsely infiltrated with chronic inflammatory cells. In the more virulent infections ulceration may be present and involve the periosteal layers. This type of disease is usually due to a staphylococcus.¹ In the low grade infections cysts may develop or polypi may form if allergy is also present. The lower sinuses are liable to infection from those above them. The right antrum is more frequently infected than the left, because most people habitually sleep on the right side.

Treatment Delaying Resolution.

We should not fail to consider some causes which may prolong a nasal infection. Among these must be listed some of the results of surgical operations and nasal irrigation treatments. Although Dr. McGregor of Toronto has demon-

*From Symposium on Upper Respiratory Sepsis, Manitoba Medical College, Post Graduate Course, September, 1935.

strated that normal ciliated epithelium and even mucus glands regenerate rapidly after complete curettage of a sinus when the conditions for healing are good.² Dr. Hilding working at the Mayo Clinic has found that if vascularization is poor, fibrous bands may develop which hinder normal drainage and particles of epithelium submerged in the scar tissue may form cysts.³ If infection is present there is a massive production of scar tissue without adequate epithelium covering it. Partially amputated turbinates have an impaired circulation and do not withstand frosty air as well as a complete turbinate does. But even the most critically minded physician will agree that adequate space for nasal breathing is a necessity for proper respiratory function and general body development. After all other methods have been exhausted, surgery is the only means of attaining this.

In the common nasal treatments one has to keep in mind the possibility of irrigation transferring infection from an infected sinus to a healthy one. Even such a bland solution as normal physiological saline removes the protective layer of mucus, stops ciliary action and causes an enormous edema of the columnar cells lining the sinus. Strong cocaine, menthol, thymol and eucalyptol slow ciliary activity, epinephrine, zinc sulphate and mercurochrome are even more harmful and 0.5% silver nitrate destroys all ciliary activity.⁴ Fortunately these cells regenerate very rapidly. Many current ideas concerning local treatment are survivals from the days before bacteria were regarded as the cause of disease when pus was regarded as something to be completely washed out rather than merely providing an exit for it. We now know that the bacteria beneath the mucosa cause the inflammatory mischief and these organisms cannot be successfully destroyed by any local application without also destroying the mucosa to a greater degree and making the end condition worse than the original one. The main channel for spread of infections is through the submucosal lymphatics. Healthy, intact mucosa is remarkably resistant to bacteria on its surface. Apparently the nasal mucosa is so delicate that it will tolerate nothing but air and even air of unusual temperatures or humidity disturbs its equilibrium (see fig. 1 and 2). Swimming, and especially diving, is likely to lead to sinusitis unless special precautions are taken to keep water out of the nose. The irritation of water that is not isotonic produces a tremendous mucosal edema which allows ready access for bacteria.

Allergic Rhinitis.

Allergic rhinitis is less common than infectious rhinitis but an infection may complicate it. The disturbance is essentially a vascular one. This basic capillary fault is inherited like the color of our eyes or our facial profile. Therefore, it never can be removed although it may often be favourably modified to make the afflicted unaware of any symptoms over a period of months or even years. When touched by very small amounts of

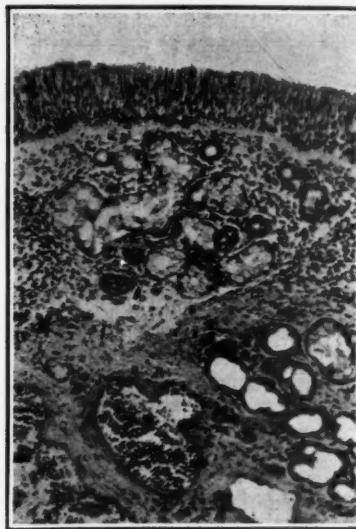


Fig. 1.—Section of middle turbinate (x100) showing mucus glands surrounded by a slight increase of inflammatory round cells. The blood vessels are dilated and contain erythrocytes. The compound, columnar, ciliated epithelium is intact.



Fig. 2.—Section of mucosa (x600) from Fig. 1 showing compound columnar epithelium containing some mucus. At the right is an ostium of a mucus gland. The cilia on the surface are distinctly seen.

specified irritants the capillaries become dilated and pour out an excess of plasma to make the tissues edematous and the mucosa drip an abundant watery secretion. Rhinologists recognize the pale or mottled swollen and doughy appearance of the mucosa. The presence of eosinophile cells in the nasal discharge often helps to distinguish the condition from an infectious process. These cells are well shown up by a Wright's stain.

In allergy the clinical history is a most important differentiating feature. Summer recurrence points to pollens as a cause. Sudden attacks in certain rooms or special locations with com-

plete remissions in others indicate some external dust as an exciting cause. Cutaneous tests with protein extracts are sometimes helpful in tracking down a single cause. But there are far more patients suffering from minor degrees of a chronic vasomotor rhinitis for which no external irritant may be discovered. Their condition is greatly aggravated when the food intake is excessive and the body secretions lethargic. It is more a matter of excessive food intake than any one article of food being culpable.

Such cases are not reported in the medical journals because they lack any spectacular features. Nor are they adequately dealt with in medical text books or student clinics. These patients have real distress often for years. The subject is worthy of more than passing notice. Because of lack of a direct cause contributory causes have to be prominently considered here. Among these I would list—

1. An overloaded stomach.
2. A poorly functioning skin through lack of daily exercise which produces active perspiration.
3. Sitting in hot, stuffy, smoky atmospheres.

A walk in fresh cool air will contract congested turbinates and open up a nose block. A smart sprint will contract almost anyone's turbinates as closely to the bone as an application of adrenalin, and it has no unfavourable after reaction.

Nutrition.

It has long been recognized that the onsets of colds or infectious rhinitis is more common on Mondays and Tuesdays, and a reasonable explanation is over eating and under exercising during the week-end. If Sunday is to be a day of rest it should be more of a fast day than a feast day. Lack of nutrition as a predisposing cause of respiratory infection is exceedingly rare in this country. The incidence of common colds was about the same in three groups of nurses who were given (1) Vitamine A, (2) ultra violet radiation and (3) the ordinary well balanced diet.

Systemic Effect of Sinus Suppuration.

Post-nasal discharge is so common that it is almost universal, especially in the winter months. One often sees thick mucopus adhered to the posterior oro-pharynx and the fasting gastric contents recovered often contain an ounce of mucopus. Many of the patients with large masses of mucopus adhered to the pharynx do not complain of any nasal or throat symptoms at all. Others, often with less post-nasal accumulation, complain bitterly. Nervous sensitiveness and introspection must be a factor here. Dr. Anderson of the Mayo Clinic failed to find any systemic effects in 400 consecutive cases of suppurative sinusitis and is led to the conclusion that sinus suppuration is not an important cause of systemic disease.⁵ He has had a wide experience with patients who would be thoroughly investigated.

Hygiene.

General hygiene is, of course, very important. The proper amount of exercise and sleep is often sadly neglected. A general chilling produces a superficial pallor which extends into the respiratory tract. This temporary anemia of the respiratory mucosa lowers resistance to bacteria on the surface. Hygienic sins, however, are more common than moral ones and physiological righteousness is very difficult to maintain. A moderate self-discipline gives results that are worth while.

Bacterial Etiology.

So far we have considered man the host, and mainly from the structural viewpoint. Of far greater fundamental importance is the virulence of the invading bacteria and the individual's immunity to it. It is a humiliating thought that man, who is the lord of creation, should so often ultimately succumb to invasion by the most lowly form of vegetable life, namely, bacteria. There is not enough attention paid to this in diagnosis and treatment. On looking up a series of records of 20 recent cases selected at random in Winnipeg General Hospital that had had surgical operation on the nasal sinuses only two had any report on the etiological organism. Of the others, there was not even a report of a microscopic examination of the pus by the interne. This indicates a concept of etiology that is mechanical rather than bacterial and immunological.

The interior of a normal nose is practically sterile apart from the anterior two-thirds of an inch which may contain organisms common to the skin surface or the air; also the lower nasopharynx contains in fewer numbers the microbes commonly found in the throat. This sterile state of the nose is maintained by the action of the cilia and the natural downward flow of the protective layer of mucus.

Specific Infectious Diseases.

The infectious diseases produce as complications some of our most persistent and serious upper respiratory septic cases, but there is now the cheerful prospect that some of them are preventable. Scarlet fever has as common complications sinusitis and otitis, but it is now possible by immunization with 5 doses of Dick toxin to prevent this disease in 90% of those who are susceptible.⁶ But even after protective inoculation or in those who show immunity to scarlet fever by a negative Dick test, mucosal infection by hemolytic streptococci can produce upper respiratory sepsis. Although it is the opinion of physicians who study the effects of immunization at first hand, that the incidence of upper respiratory sepsis due to hemolytic streptococci is less in those who are immune or immunized or receive prompt serum treatment when infected, there are no statistical percentages as yet available on this problem.

In whooping cough, sinusitis may be present as a complication but otitis is commoner. Some writers quote otitis developing in 5% of cases. The new pertussis vaccine of Sauer is an effective

prophylactic, and convalescent serum given before the end of the incubation period ameliorates the course of the disease. One-half the deaths from whooping cough occur in infants under 1 year of age. Under 2 years the mortality is very high.

Measles is likely a virus disease and the bacteria invading secondarily may produce a persistent sinusitis otitis or mastoid infection. There is no agent to produce active immunization but placental extracts,⁷ convalescent serum or treble quantities of parent's blood given subcutaneously before the eruption develops will give an abortive form or even prevent the eruption occurring altogether. The globulin extracts from the human placenta contain diphtheria, scarlet fever, measles and poliomyelitis antibodies and antitoxins which are effective when taken by the oral or injection method.

The problem of diphtheria prophylaxis and serum therapy is well developed, and as the immunizing toxoid is very effective, total abolition of diphtheria infection is a public health ideal.

Epidemic influenza is from the most critical investigation up to date, initiated as virus disease and any pyogenic bacteria may become secondary invaders. The influenza bacillus is only one of the possible secondary invaders and probably not the most important. During the small Winnipeg epidemic in January, 1936, the pneumococcus, often a Type 3, and the staphylococcus were found in the lungs of some of the fatal cases on which autopsy was performed. It is the secondary invading bacterium and not the primary virus that causes the sinusitis, otitis or pneumonia.

Septic Tonsils.

Infected tonsils, adenoids and bronchiectasis require consideration as foci of upper respiratory sepsis. Removal of tonsils and adenoids which are subject to recurring acute inflammation or chronic inflammation reduces the incidence of sore throats, scarlet fever, diphtheria and cervical adenitis. Acute head colds and otitis media in children, though definitely lessened over the three year period following operation, are not essentially influenced over a 10 year follow-up period. This effect is probably due more to the removal of infected adenoid tissue than to the removal of tonsils. Contrary to the prevailing impression laryngitis, bronchitis and pneumonia occur more frequently in tonsillectomized children.⁸

Septic lung disease is a prominent cause of sinus re-infection. The natural drainage of sinuses is better than the drainage from bronchi and a sinus tends to heal, but during coughing fits small flecks of highly infective sputum fly up past the soft palate into the posterior nasopharynx, and unless the natural resistance is good the sinus becomes infected. Postural lung drainage may act in the same way. There is also the possibility of lymphatic extension from the bronchial tree to the nasal sinuses, but this is difficult to prove.

The Common Cold.

Although we cannot regard the question as settled, the majority will agree that the earliest stages of the common cold or acute rhinitis are the result of a contagious virus infection.⁹ A virus is so small that it escapes detection by microscopic methods which reveal all ordinary pyogenic bacteria. The incubation period of the rhinitis virus in the human is 12 to 24 hours. The burning sensation in the nose, the rhinorrhea and the general malaise increases for 48 hours but after that, if the infection is uncomplicated, the symptoms rapidly diminish and recovery takes place within 5 days. But the primary inflammation caused by the virus provides easy access to the pyogenic bacteria which usually cause a prolonged suppuration. Moreover, there is experimental evidence to show that the virus in itself increases the virulence and multiplying power of the bacteria already present in the respiratory tract.

This is a reasonable explanation of why common bacterial vaccines tried in many ways during the last quarter of a century have not been generally successful in preventing common colds. A virus requires living culture media (usually chick embryo is used) and it immunizes only when a live culture slightly weakened by antiseptics or heat is injected.

Immunity Produced by Vaccines.

It is a tragic commentary on man's sense of values that there is already available a successful virus inoculation for dog distemper while we have none as yet to prevent our common cold. Furthermore, this successful distemper virus was the result of prolonged investigation paid for by the breeders of sporting dogs in England, while the owners of silver foxes in Canada, who had lost millions of dollars through distemper epidemics, withdrew financial support from a single investigator, working in a poorly-equipped laboratory just after he proved that distemper was due to a virus. The fact that one attack of distemper confers immunity if it does not kill the animal, and human influenza does not, would suggest that there is probably more than one type of virus capable of producing the epidemic influenza in humans.

Bacterial vaccines, however, do have a place in restricting respiratory infections. They aid in preventing the complications due to pyogenic bacteria which prolong the infection and cause sinusitis, otitis and pneumonias. Some careful investigators have shown that, in some instances at least, ordinary pyogenic bacteria may cause rhinitis without a preceding virus infection.¹⁰ Sinusitis is probably wholly the result of a bacterial invasion.

The greatest difficulty in immunizing is due to the fact that in successive attacks of rhinitis and sinusitis different bacteria or at least different strains of the same organism are present. Last winter I prepared films of my nasal secretion each time I had a "cold". During a brief attack

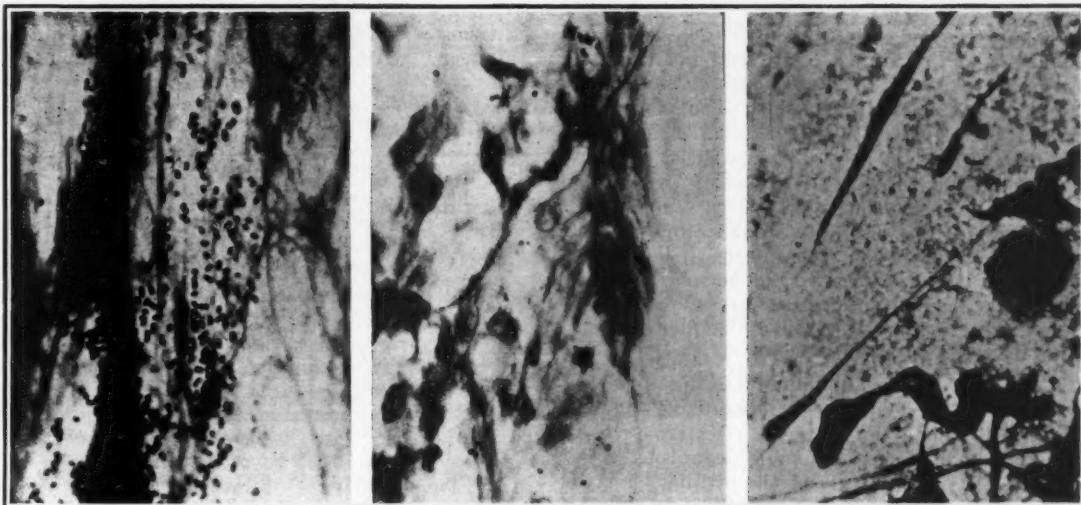


Fig. 3.—Bacteria present in attacks of purulent rhinitis during the winter 1934-1935. All magnified 1000 diameters.
 (a) Pneumococci Nov. 20, 1934. Group 4.
 (b) Staphylococci Dec. 27, 1934. A clump below the centre is slightly out of focus.
 (c) Influenza bacilli May 19, 1935. Small cocco-bacillary forms.

starting November 20th there was a profuse yellow purulent discharge containing myriads of pneumococci. No other organism was present. It did not show any reaction with Type 1, 2 or 3 serum and therefore would be classed as group 4.

³On December 27 another attack developed. Microscopic examination of the nasal secretion showed a staphylococcus to be the predominating organism with a few diphtheroids also present. Too much Christmas feasting was likely a prominent contributing factor in this attack.

On May 19th a more severe attack developed and my nasal secretion at this time showed a pure culture of influenza bacilli. Other members of the laboratory staff had rhinitis at the same time and due to the same organism.

The pneumococcus, streptococcus and staphylococcus are the commonest invaders. The influenza bacillus, micrococcus catarrhalis, diphtheroid and Friedlander's bacillus are less common.

When stock vaccines containing several types of bacteria are administered the dose of any one is usually too small to produce an adequate amount of antitoxin or antibody. Within wide limits the amount of immunity is in direct proportion to the amount of bacterial protein, toxin or toxoid inoculated. Next in importance in accounting for failure would be the want of properly standardized products for inoculation. Bacterial vaccines are crude antigenic substances and different cultures of the same organism may vary enormously in their immunizing properties. Despite this, colds in the well-inoculated have about half the febrile period occurring in those who do not receive any injections, although the incidence as shown by statistical investigation is not appreciably decreased. But too many injections are required to commend the procedure for general use.

Recently a high degree of immunity against rhinitis has been claimed following the repeated intranasal spraying of bacterial vaccines to increase the local immunity of the nasal mucosa.¹¹ More extensive experience will be needed to prove that this procedure merits general acceptance. There is no single antigenic substance yet produced having a high immunizing power against a wide variety of bacteria. No method has been discovered as yet to reduce the toxic effect and retain the immunizing effect.

Since a staphylococcus accounts for about one-third of acute and chronic cases of sinus infection it will be interesting to observe if the staphylococcus toxoid, recently produced, will successfully prevent acute staphylococcus infections and if it will promptly cure the chronic ones.¹²

The pneumococcus is responsible for about one-third of the acute upper respiratory infections but there are many different strains. Vaccine inoculation, using specific strains, gives satisfactory protection against all but the type 3 organism, which is not common in upper respiratory disease. The immunity against type 1 lasts over a year but that against type 2 only lasts a few months.¹³ Group 4 pneumococcus is a common finding in acute upper respiratory infections but it does not produce very severe disease. This group is made up of over 30 strains. The great incidence and mortality from pneumococcus pneumonia among miners in South Africa has been greatly lessened following the thorough inoculation methods carried out by Dr. Lister.¹⁴ For his vaccine he collected strains of bacteria prevailing in the community at the time. He used the different system of typing to that used in America and Europe. His most frequent types are in our group 4.

The streptococcus has so many strains that preparation of an effective antigen even for all

the hemolytic type is difficult. The defense mechanism of the human body does not develop antitoxins against the streptococcus as readily as it does against other organisms. The most successful attempt so far is scarlet fever streptococcus toxin which is a potent standardized antigen made from the hemolytic streptococcus present in scarlet fever throat infection. Dr. Wadsworth, director of the New York State Laboratories, from much investigation on streptococcus immunity believes that inoculation with one hemolytic strain produces an antitoxin which gives protection against other hemolytic strains.¹⁵ Other investigators disagree with him.

It is probable that by administering a series of injections each of these immunizing agents *seriatim* one could obtain more effective protection against the most common organisms than would result from the use of the ordinary mixed stock respiratory vaccine. Since there is no successful vaccine for the primary virus causing epidemic colds and influenza, is it worth while attempting to augment the immunity against some of the most common and serious secondary invading bacteria? Have we any alternative benefit to advise? Physicians, and the general public as well, demand a degree of perfection in prophylactic inoculation that far exceeds the standards demanded in other branches of medicine. Unless some potent antigen is developed which will in a few inoculations successfully immunize against most forms of upper respiratory sepsis, each individual's problem will be decided on its own. Immunizing injections of potent antigens like staphylococcus toxoid, scarlet fever toxin (for hemolytic streptococcus) and pneumococcal vaccines will only be advised for those who have more than two or three prolonged attacks of acute rhinitis each winter.

Although there are many accessory factors in the production of disease, we must not lose sight of the main etiological cause—namely, a virulent respiratory infection that is contagious and will make inflammatory inroads on the respiratory tracts of all, the physically perfect as well as the decrepit, except those who have a high degree of immunity. Experience in the successful control of other infection would indicate that such a high degree of immunity can be hoped for only by artificial immunization.

To sum up—

In the etiology of upper respiratory sepsis—

1. An allergic constitution should be excluded.
2. We should not lose sight of the fact that pathological changes in the nose are more the result of disease than the cause, although they may be a contributing cause by interfering with normal drainage and respiration.
3. Bad hygiene is a very important contributory cause, especially over eating of a poorly balanced diet, lack of physical exercise and lack of sleep.
4. The most direct cause of upper respiratory infection is the transmission of virulent microbes from others who harbor such infections. As it is not possible to avoid these under present con-

ditions of living we should take full advantage of every advance in immunization methods.

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*The Findings of Eye Examinations

AN ANALYSIS OF 10,000 CASES

By

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of the British Medical Association*

At the recent Annual Representative Meeting of the British Medical Association, in presenting the report of the Ophthalmic Committee, I gave some figures of the findings of the examination of the eyes of a number of patients who had obtained their ophthalmic treatment through the medium of the National Ophthalmic Treatment Board. There have been many inquiries about those figures, and, since some new facts have been gathered, a fuller record of them may be of value.

The investigation arose from a desire to get detailed information of the conditions found in a fair average sample of the patients seen through the Board's organization all over the country. At different times figures have been obtained from amongst hospital patients, and some ophthalmic surgeons gave us returns for their private patients, but it was thought by some that these returns might not give a fair indication of the conditions for which patients, many of them members of approved societies, sought eye treatment. Some averred that what these latter people needed was "just glasses"; and they said in effect, Let them choose what suited them with such assistance as a well-meaning optician might be able to afford them, and their need would be met; others asserted that the opticians were now so well trained and tested by their several trade organizations that they were quite capable of discovering and dealing with the cases that were what they termed "simple refractions," and of referring cases other than these—that is, of disease or defect—for the more expert examination of the ophthalmic surgeon.

A number of ophthalmic medical practitioners working in different parts of the country who

were in the habit of seeing considerable numbers of patients through the Board were asked to keep records of the patients examined by them. To enable the records to be compared, cards were issued to these doctors giving a short but sufficient classification of the conditions which were likely to be found, with directions as to the manner of entering the returns. There was to be no selection of the cases; all received through the Board were to be recorded. By this date returns of 10,085 patients have been received from forty-seven doctors, who practise in such parts of the country as give a fair representation of the country generally. I wish here to express my thanks to those doctors who took so much time and trouble in making the returns; the purpose of the inquiry may not have been evident to them when the request for information was made, but they will see the results of their labours in this paper.

The returns were handled by a competent statistician, and the following tabulation was obtained:

Total No. of cases analysed	10,085
No. of doctors supplying records.....	47
No. of cases of error of refraction only.....	6,464 or 64.09%
No. of cases of error of refraction plus one or more "other eye conditions".....	2,940 or 29.15%
No. of cases without an error of refraction but with one or more "other eye conditions"	580 or 5.75%
No. of cases with no appreciable eye defect	101 or 1.00%

In the cases included in the above analysis the following types of error of refraction or other eye conditions were found:

Errors of Refraction

Hypermetropia	in 1,357 cases or 13.45%
Hypermetropia and/or astigmatism	" 4,481 " 44.43%
Myopia	" 387 " 3.83%
Myopia and/or astigmatism	" 1,867 " 18.51%
Odd eyes	" 351 " 3.48%
Presbyopia	" 3,743 " 37.11%
Mixed astigmatism	" 235 " 2.33%

Other Eye Conditions

Diseases of conjunctiva—lids and/or sac	" 704 " 6.98%
Diseases of cornea—all forms.....	" 237 " 2.35%
Diseases of uvea—all forms.....	" 544 " 5.39%
Optic neuritis or atrophy.....	" 105 " 1.04%
Cataract—all forms and stages.....	" 806 " 7.99%
Glucoma—all forms and stages...	" 72 " 0.71%
Myopia—over 5 D in both eyes....	" 311 " 3.08%
Squint—latent or patent	" 632 " 6.26%
Constitutional diseases or ocular affections	" 489 " 4.84%
Bad conditions of work.....	" 35 " 0.34%
Injuries or effect of injuries.....	" 71 " 0.70%
Other material conditions	" 263 " 2.60%

EYE CONDITIONS OTHER THAN ERRORS OF REFRACTION

The major finding arising out of the figures is the fact that one in every three of the patients seen had some defect of their bodies or their eyes other than an error of refraction. Such a finding may seem startling to those unfamiliar with eye work, but it is within the ordinary experience of ophthalmic surgeons. Tired eyes and inability to see easily or clearly mean to most people a need for glasses; it is a natural enough idea, and the assumption may be right or it may be wrong.

Only an examination by an expert can determine the point. In effect the returns show that for most the assumption is true, but for the many it is untrue. Similarly, a patient sometimes cheerfully explains that an eye that is slightly red and sore is so because "a fly got into it two or three days ago," whereas an appropriate examination shows a deposit of fine dewdrop precipitates inside the eye on the back of the cornea, and proves that no trivial external irritant, but some serious internal sepsis, is the cause of the trouble.

The category of eye conditions other than errors of refraction is plain evidence of the seriousness for the need of expert examination. Conjunctivitis or sore eyelids are a real handicap to the worker; the discomfort caused is not conducive to good work; personal appearance is poor; whilst the risk of a septic lachrymal sac to workers exposed to flying particles, as lathe-workers, hammermen, or road menders, is common knowledge.

Diseases of the uvea, which include iritis, cyclitis, choroiditis, and retinitis, are dangerous conditions. Not only do they present, if unchecked, grave risks to the sight, but they indicate in the majority of cases some constitutional trouble needing attention. So one could comment upon the other items of the list: optic neuritis or atrophy, cataract, glaucoma, and so on. Optic nerve trouble may in its onset suggest no more than the want of glasses, and glasses may indeed help, and perhaps satisfy the patient with some improvement in his sight for a time; yet failure in diagnosis may mean irrecoverable loss of precious time in discovering and attacking the basic condition responsible for the nerve trouble. Cataract may undoubtedly be delayed in its progress by early treatment, change of work, of regime, and so forth, therefore its recognition in the earliest stages is useful.

The dread disease of glaucoma, the probable cause of Milton's blindness, is almost always associated with some change in refraction, for which new glasses are appreciated, but these may be a dangerous snare if the presence of the disease be unrecognized. Latent squint is a prolific cause of chronic eyestrain, headache, and invalidity; handled well the relief may be magical, mis-handled the aggravation may be serious.

Constitutional diseases—Independent of disease setting up any of the preceding ocular conditions—are accountable for apparent asthenopia, but the tired eyes are often not at fault; it is the general laxity of tone. The dyspeptic is a common complainant of tired eyes. To order glasses and nothing else for a man suffering from a dilated stomach, with all its attendant disabilities, is to add insult to injury, or to display a naïve belief in the uplifting effect of glasses! Among the "other material conditions" are included twenty cases of tobacco amblyopia—a remarkable finding in these days of costly tobacco and spirits. The number (3,743) and the percentage (37.11) of cases of presbyopia—that is, of patients over

about 45 years of age in need of glasses for near work, only shows that the majority of the patients examined were of the young and early middle-aged workers—just those from whom we expect the best work, for whom good eyesight is most important, and for whom we ought to provide the best eye treatment.

A CONTROL

Is it possible to check these figures in any way? Can we find some sort of yardstick which will act as a control? There is happily one finding by which we are able to secure an effective control. Certain factors of the cases seen through the N.O.T.B. scheme are recorded and filed at the office of the Board. One of these shows how many patients are reported by the ophthalmic medical practitioners as not requiring glasses. The matter is naturally of importance from the dispensing optician's point of view. Hence the keeping of the record. Mr. Harwood, the secretary of the Board, has had these figures analysed for the twelve months from September 1st, 1933, to August 31st, 1934. There were brought into account 68,047 cases, of which 4,115 were found not to require glasses, or a percentage of 6.05. Among the cases brought into this particular statistical inquiry the number of cases for whom no glasses were ordered were those marked as "other eye conditions" (580, or 5.75 per cent.), and those in whom no appreciable eye defect was found (101, or 1 per cent.)—a total of 681 cases, or 6.75 per cent. There are, then, these two returns:

Of 68,047 cases seen by 821 doctors 4,115 did not require glasses, or 6.05 per cent.

Of 10,085 cases seen by forty-seven doctors 681 did not need glasses, or 6.75 per cent.

One could not expect a closer approximation in two such returns. The control thus afforded is strong evidence for the trustworthiness of the reports of the medical conditions found among the cases which have been brought into this analysis—if, indeed, such confirmation of its trustworthiness be needed.

THE LESSONS

So far the lesson of the returns is the need for expert examination of the eye. But there is another lesson to be learned. There are those who believe that the examination of patients' eyes by sight-testing opticians is both a satisfactory and an economical proposition. The comparison of these medical returns with certain other returns shows that neither of these beliefs is borne out by the facts known.

When I received the first figures of this analysis, which were presented to the Representative Meeting in July, and learned that no less than 36 per cent. of the cases seen needed attention other than the provision of glasses, I sought to find out what proportion of cases seen by sight-testing opticians were similarly reported, and referred by them to ophthalmic surgeons for further examination. At first there was a remarkable difficulty in getting any answer to this simple question. No one knew, or, knowing, would tell. The most that could be got by way of answer was

an expression of opinion that on the average not more than 10 per cent. were so referred for further examination. That figure I quoted in July; since then some definite information has been obtained. Certain approved societies have been good enough to supply actual figures of referred cases during 1933 or 1933-4. I may not give the names of the societies, but they are weighty. They represent several millions of insured persons, and they provided ophthalmic benefit to several thousands of their members. In these returns the percentage of cases referred by the sight-testing opticians to ophthalmic surgeons ranges from 1 to 4.6; the average is 3 per cent.

There is, then, this astonishing comparison: in a series of patients examined by ophthalmic surgeons 2,940 cases, or 29 per cent., proved to be cases other than errors of refraction alone, and no fewer than 580 or 5.75 per cent. cases of other conditions without any error of refraction; yet the percentage of cases referred "for further examination" by the opticians, who profess only to be able to deal with errors of refraction, was only 3.

CONCLUSION

The conclusion is irresistible. The opticians did not recognize the defects present in the eyes of the patients seen by them, or if they did recognize them they did not report them for medical examination.

The corollary is this. Patients who go to opticians to have their sight tested do not get what they want, or they do not get what they ought to get. Such a finding is conclusive of the proposition that an examination by an optician is uneconomical, and conversely that approved societies or others who are responsible for advising patients to seek eye examination cannot in the interests of these persons do other than adopt the only economical method—that is, by securing examination by competent ophthalmic medical practitioners.

There is nothing new in this conclusion. It has been the finding of three separate Government inquiries:

"We are of the opinion that it would be undesirable and a positive danger to the public for Parliament to pass any measure which might convey the idea that an optician, who is a person qualified to provide glasses prescribed by medical men, is further himself competent to examine the eyes of patients and to prescribe glasses for the correction of errors of refraction." (Departmental Committee on the Causes and Prevention of Blindness, 1922.)

" . . . we are satisfied that the number of cases in which the patient may miss the opportunity of remedial treatment if the case is not handled by an oculist is by no means negligible." (Departmental Committee on National Health Insurance, 1925.)

" . . . we are satisfied that the number of cases in which the patient may miss the opportunity of remedial treatment if the case is not handled by an oculist is by no means negligible." (Departmental Committee on the Optical Practitioners Bill, 1927.)

But this is the first time that the conclusion of the true economy of a medical examination of the eyes has been based upon figures of such volume as to compel attention.

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